For EFI™ VUTEk® QS2000, QS3200, QS3220, QS220 Printers

Quick Links

3M Graphics Warranties
Technical Information Selector
Safety Data Sheets (SDS)
3M Color Profiles
Videos

Some of these links lead to web-based resources that are not product-specific.

Product Description

- UV-cured inks
- Available colors include Magenta, Yellow, Black, Cyan, White, Light Magenta, Light Cyan, and Yellow Shade Magenta

Product Features

- Designed for printing on inkjet-compatible 3M films and media for making warranted multicolor graphics
- Durable and weather-resistant
- Excellent color retention
- Flexibility and conformability makes them suitable for graphics used on curved, corrugated and riveted surfaces as well as flat surfaces, depending on the base film used

Disclaimer

With the exception of 3M branded products, 3M does not represent that any printer or printer accessory recommended in 3M literature will meet customer requirements, any federal, state, or local regulations or any applicable safety standards. Such determination is the responsibility of the printer owner.

Product Line

Ink

Container size: 3.25 liter (3.4 quarts) cubitainer, two per carton

Thinner

Current cleaning solvent as recommended in the EFI VUTEk printer literature.
Note: In the U.S., these inks and thinners are sold exclusively by EFI VUTEk. Call 1-877-EFI-INKS (334-4657) or visit www.efi.com.

Recommended Compatible Products

3M Compatible Products for 3M™ MCS™ Warranty

- Many 2-mil and 4-mil graphic films, reflective films, flexible substrates and graphic protection methods are warranted for finished graphics using this ink.
- For the most current listing of 3M compatible products, go to the Warranty Matrices at www.3Mgraphics.com/warranties
- See the 3M Graphics Warranty Bulletin for information on reduced warranties for different exposures.

3M Intermediate Graphic Materials

This ink may be used with 3M's Intermediate Product line for low cost graphics that do not need a graphics warranty. Refer to the Inkjet Materials and Solid Color Films Brochure at 3Mgraphics.com to see the 3M Intermediate Product Portfolio.

Other Graphic Materials

This ink series also may perform satisfactorily on many other 3M and non-3M graphics materials, but would not warranted by 3M.

Always run a test print to be certain that the finished graphic quality meets your needs. Also check adhesion and scratch resistance of any graphic protection used. Contact the printer manufacturer and material manufacturer for guidance.

Certificate of 3M™ MCS™ Warranty

Graphics manufacturers who produce digitally printed graphics made with all 3M Graphics Products, including 3M Ink purchased through a qualified 3M Distributor or 3M Printing Partner, may register to be recognized with a Certificate of 3M™ MCS™ Warranty. Only graphics manufacturers having a current Certificate of 3M™ MCS™ Warranty are eligible to extend this warranty to their customers.

NOTE: For non-printed Finished Graphics, check your eligibility for the 3M™ MCS™ Warranty by viewing the 3M Graphics Warranty Period Selector at www.3Mgraphics.com/warranties.

Warranty Information

Warranty Coverage Overview

The warranty coverage for eligible graphics is based on the user both reading and following all applicable and current 3M Graphics Product and Instruction Bulletins. The warranty period for eligible graphics is as stated in the 3M Graphics Warranties Matrices at the time that the film was purchased. Information found at 3Mgraphics.com/warranties includes:

- 3M Graphics Warranties Bulletin
  - This bulletin contains information on limitations and exceptions, and warranty period reductions for 3M Graphics Warranties. The warranty period may be reduced and stipulations may apply for certain constructions and applications, and graphic exposures as covered in this Bulletin.
- 3M Graphics Warranties Selector
  - Use this selector to search for your vertical warranty period by product number, ink type, and ink/printer platform.
- U.S. Desert Southwest Region Map
  - Use this map of hot, arid desert areas to determine if you are subject to reduced warranted durabilities.

The warranties set forth in this Bulletin are made in lieu of all other express or implied warranties, including any implied warranty of merchantability, fitness for a particular purpose, or arising out of a course of dealing, custom, or usage of trade.

3M Basic Product Warranty

3M Graphics Products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in its applicable 3M Graphics Product Bulletin and as further set forth in the 3M Graphics Warranties Bulletin.

Limited Remedy

The limited remedy applicable to each warranty is addressed in the 3M Graphics Warranties Bulletin found at 3MGraphics.com/warranties.

Limitation of Liability

Except to the extent prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT (EXCEPT FOR THE LIMITED REMEDY PROVIDED HEREIN), INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LABOR, NON-3M MATERIAL CHARGES, LOSS OF PROFITS, REVENUE, BUSINESS, OPPORTUNITY, OR GOODWILL) RESULTING FROM OR IN ANY WAY RELATED TO 3M'S GRAPHICS PRODUCTS, SERVICES, OR THIS BULLETIN. This limitation of liability applies regardless of the legal or equitable theory under which such losses or damages are sought.

Warranty Period Matrices

See the 3M Graphics Warranties Matrices at 3MGraphics.com/warranties, for vertical warranty period information specific to your film.

Additional Limitations

See the 3M Graphics Warranties Bulletin at 3MGraphics.com/warranties, for terms, additional limitations of your warranty, if any, information on reduced warranties for different exposures, and limitations of liability.

Support Information

- 3M products: Contact 3M Commercial Solutions Technical Support at 1-800-328-3908.
- Printer, software, ink, and profiling: Contact EFI VUTEk at 1-603-677-3111 or www.efi.com.

Health and Safety

⚠ CAUTION

When handling any chemical products, read the manufacturers' container labels and the Safety Data Sheets (SDS) for important health, safety and environmental information. To obtain SDS sheets for 3M products go to 3M.com/SDS, or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

Ventilation

Provide local and/or general exhaust ventilation in the print production areas to prevent a build up of ink vapors and to maintain levels below the limit for worker exposure. An experienced industrial ventilation engineer and/or a certified industrial hygienist can help evaluate your ventilation requirements and design based on your onsite process conditions.

Please refer to the printer manufacturer's literature for additional details and requirements.

Air Quality Regulations

State Volatile Organic Compound (VOC) regulations may prohibit the use of certain chemicals with VOC's in graphic arts coatings and printing operations. For example, the California South Coast Air Quality Management District prohibits use of certain solvent-based solutions without a permit and other California AQMD's prohibit use of certain solutions without a permit or regulatory exemption. Check with your State environmental authorities to determine whether use of this solution may be restricted or prohibited.

More on Environmental Health and Safety

Additional environmental, health, and safety information is available on our website at 3Mgraphics.com/sustainability.

Selecting, Preparing and Using 3M Graphic Materials

- Use the right film for the job. Each film has specific intended uses, processing conditions and durability. Always refer to the 3M Product Bulletins for each product used and to the recommended 3M Instruction Bulletins referenced in those 3M Product Bulletins for complete details. 3M Product and Instruction Bulletins can be found at www.3MGraphics.com/TechInfo.
- Condition the film, ink and graphic protection for 24 hours in the same environment as the printer before using.
- Shake the ink prior to installing it in the printer and once a week after installation to prevent pigment settling. To avoid introducing air bubbles into the ink supply, do not print or purge for 5 minutes after shaking.

Ink and Film Processing Recommendations

Refer to the printer manufacturer's instructions for setup and adjustment to achieve good image quality and to ensure proper ink and film processing.

Following is a cure table showing recommended starting points for printing media.

⚠ CAUTION

Before handling any chemical products, always read the container label and the SDS.

Curing Table

Resolution	Light Smoothing		Heavy Smoothing	
356 x 540	Double Shutters	High Lamps	Post Shutters	High Lamps
356 x 1080	Post Shutters	High Lamps	Post Shutters	Low Lamps

ⓘ IMPORTANT NOTE

Lamp output is highest with new lamps and will decrease over time. Regularly verify that curing is still adequate at the settings you are using.

Processing Details

Requirements for Warranted Graphics

- An optimized curing dose prevents both over curing and under curing the ink.
- Over curing occurs when the cure dose is too high. It reduces liquid clear coat adhesion to the ink and the ink flexibility is reduced, leading to cracking.
- Under curing occurs when the cure dose is too low. It results in poor ink adhesion, so the ink can be scratched off easily, and poor ink abrasion resistance if no graphic protection is applied. Even if an ink appears sufficiently cured, the ink may be tacky after printing. To test for adequate ink cure, rub a clean white cloth, tissue or cotton swab lightly over the ink and check if any ink transfers to the cloth.
- The optimal cure dose depends on the final graphic construction and application.
- Always test the finished construction with graphic protection applied before starting a production run.

Curing When Using a Liquid Clear Coat or Overlaminate

For liquid clear coats or overlaminates, use the lowest cure setting on your UV printer that fully cures the ink. Keep in mind that the UV ink will receive an additional cure dose as the liquid UV clear is processed. The printed ink will continue to cure at a slow rate after it has been removed from the printer. To find this setting:

1. Set the printer to its lowest cure setting.
2. Print a test sample and wipe the ink with a clean white cloth or tissue or cotton swab.
3. If any ink transfers to the cloth, increase the cure setting by one level and repeat Steps 2 and 3.
4. Use the lowest setting that does not transfer any ink to the cloth.
5. To achieve the highest clear coat adhesion, apply the clear within 3 days after printing. Check adhesion using the Tape Snap Test.

ⓘ IMPORTANT NOTE

For printed graphics without a clear coat or overlaminate, use a higher cure dose, which creates a harder ink surface for more abrasion resistance.

Check Ink Adhesion Using the Tape Snap Test

1. Use the point of a sharp razor blade, a knife, or other suitable instrument to scratch at an angle a crosshatch pattern through the ink. Do not cut into the film.
2. Use 3M™ Applicator PA-1 Gold to firmly apply a 1 inch wide strip of Scotch™ Premium Cellophane Tape #232 over the crosshatched areas.

ⓘ IMPORTANT NOTE

Applicator PA-1 is available from your 3M materials supplier. Tape 232 is available through most film or tape distributors.

3. Remove the tape by pulling it back upon itself (at 180 degrees) using a rapid, firm pull. Less than 20% of the ink should be transferred to the tape when performing the tape snap test.
4. If more than 20% of the ink transfers to the tape, increase the lamp cure setting (for example, from medium to high) or reduce the print speed, reprint and retest the ink adhesion.

Silvering Caused by UV Inkjet Printers

To reduce or eliminate silvering caused by the texture of high UV ink laydowns from inkjet printers:

- reduce oversaturation by optimizing ink limiting or need for heavy ink laydowns.
- Refer to 3M Instruction Bulletin 4.22 for additional details on laminating UV inkjet printed graphics.

Completely and Properly Cure Printed Film

To test for adequate curing, rub a clean, white cloth, tissue or cotton swab lightly over the ink. If the ink smears or transfers, the printed film is not properly cured. After winding printed film on a roll, the ink should not stick to the liner or block (change surface gloss).

When needed, consider increasing the curing temperature. Higher temperatures than 221 °F (105 °C) may cause the film or its liner to distort, or the surface texture to change. If proper curing still cannot be achieved, consider reducing the ink amounts.

⚠ CAUTION

Before handling any chemical products, always read the container label and the SDS.

Printer Settings

Refer to the printer manufacturer's technical literature for additional details.

ⓘ IMPORTANT NOTE

Be aware that not every mode will give you acceptable graphic performance. Read and follow proper curing instructions for optimum results.

ⓘ IMPORTANT NOTE

The surface temperature of the 3M graphic film liner should not exceed 221 °F (105 °C).

Managing the Amount of Ink on Film

Properly managing the total amount of ink laid down in any area on the graphic results in better image quality, less ink usage and greater throughput. It also helps ensure good film performance.

Total Ink Coverage

Total Ink Coverage: 280%

Total ink coverage is the total percentage of all ink (CMYK) used in the graphic. For example, CMYK values of 60%, 60%, 60% and 100% produces a total ink coverage of 280%. For inks, a maximum of 280% is recommended unless otherwise noted in the base film's Product Bulletin.

ⓘ IMPORTANT NOTE

Depending on the software or the color printing reference books you use, total ink coverage may be called; total area coverage, total dot area, maximum CMYK, maximum ink amount, total ink limit, total printing dot.

You can achieve very good density using lower total ink coverage with little or no loss of quality. The rest of this section discusses options for managing the total ink coverage.

Controlling Total Ink Coverage

Controlling total ink coverage can be managed by the color profile of the original artwork and during the printing process.

Getting a Color Profile

A color profile typically contains the ink limits for a specific ink set, printer and media. You can use an existing color profile that is known to produce good color output with the required amount of ink limiting. Profiles may be available from the printer manufacturer, RIP software or material supplier. Visit 3M Color Profiles at 3MGraphics.com.

Some RIP software has ink limit settings that may be adjusted without changing the color profile setup. Check the literature for the RIP software being used.

Setting Total Ink Coverage in the Original Artwork

The best time to limit the total ink used is when the original artwork is created. Have the designer observe two rules while creating the artwork to greatly simplify printing.

1. Do not exceed 280% total ink coverage.
2. The graphic designer should specify the proper ICC color profile for the film, ink and printer when submitting the artwork for printing.

Operation and Maintenance Procedures

Follow all operation and maintenance procedures recommended in the printer's user manual.

Printer cleanliness is very important in the production of high quality, full color graphics. Refer to the printer manufacturer's recommendations for compatible cleaning solutions for this ink and your printer.

Graphic Installation

Please refer to the 3M Product and Instruction Bulletins at www.3MGraphics.com/TechInfo for the film and graphic protection you are using for detailed usage and graphic installation procedures.

Graphic Installer

The graphic installer needs to be aware of any special handling or application techniques for the construction. Any combination of high total ink coverages, hot ambient application temperatures and irregular application surfaces may make the application more difficult.

Some application requirements may be different due to the type of film processing. See the applicable 3M Product Bulletin for application details on each product used, as well as the recommended 3M Instruction Bulletins.

CAUTION

UV inkjet inks may crack if too much heat is used during graphic application to complex curves and deep contours as well as around rivets. When using heat during application, make sure the film surface temperature does not exceed 212° F (100° C). For best results, **always do a test application** of a printed graphic to determine how much heat can be used without damaging the image.

Waste Disposal

Refer to the product SDS and the printer User's Manual for details. Since regulations vary, consult applicable regulations or authorities before disposal.

Shelf Life, Storage and Shipping

Refer to the ink container label or contact EFI VUTEk for details.

Shelf Life

Use by the expiration date shown on the product packaging.

Shipping Finished Graphics

Refer to the base media's Product Bulletin.

Shipping Ink

Opened ink boxes and bags may no longer provide adequate protection against leaks and spills. Exercise caution when shipping opened boxes or bags to ensure prevention of spills or leaks. In the United States, refer to the SDS for further information.

Bulletin Change Summary

For the most current 3M Technical Information available to successfully use this product, please view this Bulletin electronically and click on the blue underlined links to view the relevant documents. This Bulletin has been substantially changed. Please read the entire Bulletin thoroughly.

Release G SEPTEMBER-2015:

- Added information on shaking the ink prior to installing it in the printer. See "Selecting, Preparing and Using 3M Graphic Materials" on page 3.

Release F JULY-2015:

- Updated Bulletin to new template. This Bulletin has been substantially changed. Please read the entire Bulletin thoroughly.

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